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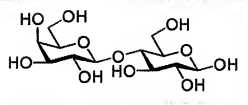
EXHIBIT A

Carbohydrate

From Wikipedia, the free encyclopedia

A **carbohydrate** is an organic compound with the general formula $C_m(H_2O)_n$, that is, consists only of carbon, hydrogen and oxygen, with the last two in the 2:1 atom ratio. Carbohydrates can be viewed as hydrates of carbon, hence their name.



Lactose is a disaccharide found in milk. It consists of a molecule of D-galactose and a molecule of D-glucose bonded by a-1-4 glycosidic linkage.

The term is most common in biochemistry, where it is a synonym of **saccharide**. The carbohydrates (saccharides) are divided into four chemical groupings: monosaccharides, disaccharides, oligosaccharides, and polysaccharides. In general, the monosaccharides and disaccharides, which are smaller (lower molecular weight) carbohydrates, are commonly referred to as sugars.[1] The word *saccharide* comes from the Greek word *σάκχαρον* (*sákkharon*), meaning "sugar". While the scientific nomenclature of carbohydrates is complex, the names of the monosaccharides and disaccharides very often end in the suffix -ose. For example, blood sugar is the monosaccharide glucose, table sugar is the disaccharide sucrose, and milk sugar is the disaccharide lactose (see illustration).

Carbohydrates perform numerous roles in living things. Polysaccharides serve for the storage of energy (e.g., starch and glycogen) and as structural components (e.g., cellulose in plants and chitin in arthropods). The 5-carbon monosaccharide ribose is an important component of coenzymes (e.g., ATP, FAD, and NAD) and the backbone of the genetic molecule known as RNA. The related deoxyribose is a component of DNA. Saccharides and their derivatives include many other important biomolecules that play key roles in the immune system, fertilization, pathogenesis, blood clotting, and development.[2]

In food science and in many informal contexts, the term **carbohydrate** often means any food that is particularly rich in starch (such as cereals, bread and pasta) or sugar (such as candy, jams and desserts).

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Structure

Polyol

From Wikipedia, the free encyclopedia

Polyols are alcohols containing multiple hydroxyl groups. In two technological disciplines the term "polyol" has a special meaning: food science and polymer chemistry.

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Polyols in food science

Main article: Sugar alcohol

Sugar alcohols, a class of polyols, are commonly added to foods because of their lower caloric content than sugars; however, they are also, in general, less sweet, and are often combined with high-intensity sweeteners. They are also added to chewing gum because they are not metabolized (broken down) by bacteria in the mouth, so they do not contribute to tooth decay.[1] Maltitol, sorbitol, xylitol and isomalt are some of the more common types. Sugar alcohols may be formed under mild reducing conditions from their analogue sugars.

Polyols in polymer chemistry

In polymer chemistry, polyols are compounds with multiple hydroxyl functional groups available for organic reactions. A molecule with two hydroxyl groups is a diol, one with three is a triol, one with four is a tetrol and so on.

The main use of polymeric polyols is as reactants to make other polymers, They can be reacted with isocyanates to make polyurethanes, and this use consumes most polyether polyols[2] These material are ultimately used to make elastomeric shoe soles, fibers (Spandex for example), foam insulation for appliances (refrigerators and freezers), adhesives, mattresses, automotive seats and so on.

Monomeric polyols such as pentaerythritol, ethylene glycol and glycerin often serve as the starting point for polymeric polyols. Naturally occurring polyols like castor oil and sucrose can also be used to make synthetic polymeric polyols. These materials are often referred to as the "initiators" for the polymeric polyols, but they should not be confused with free radical "initiators" used to promote other polymerization reactions. The functional group used as the starting point for a polymeric polyol need not be a hydroxyl group; there are a number of important polyols which are built up from amines. A primary amino group ($-NH_2$) often functions as the starting point for two polymeric chains, especially in the case of polyether polyols.

The polymeric chains built out from the initiator are usually polyesters or polyethers. Polyether polyols